EEE 31 second semester AY2016-2017 : Lab 01

Name: _____ SID: _____

0. Setup

a. Set your power supply to a value V_s given by $V_s = 5 + (ID/20)$ volts where ID is the last two digits of your student number. Verify the voltage using the multimeter.
b. Choose three (3) resistances with a ratio as close as possible to 1:2:3. A set of available resistances will be provided during the lab.
c. Construct the circuit in Figure 1 on the breadboard.

- Voltage source V_s will be provided by the power supply.
- R_1, R_2 and R_3 are the resistances you chose above with a ratio of R_1:R_2:R_3 as close as possible to 1:2:3.
- Write down the values for V_s, R_1, R_2 and R_3 beside the corresponding labels in the circuit in Figure 1.

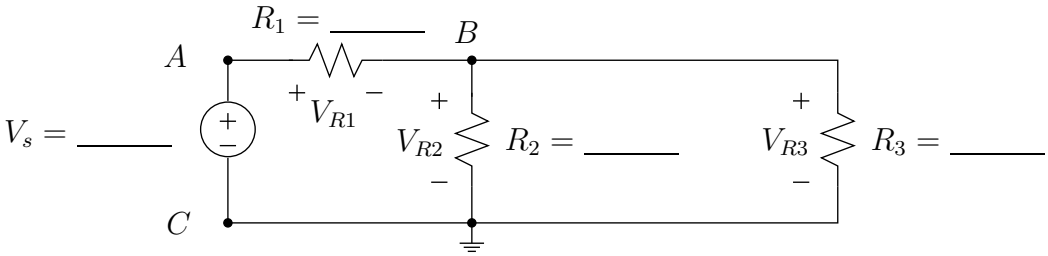

Figure 1:

1. Measure voltages V_s, V_{R1}, V_{R2} and V_{R3} in volts. Tabulate below.

V_s	V_{R1}	V_{R2}	V_{R3}

a. What is $V_{R1} + V_{R2}$? Compare with V_s.
b. What is $V_{R1} + V_{R3}$? Compare with V_s.

2. Compute V_{R1}/R_1, V_{R2}/R_2 and V_{R3}/R_3. Tabulate below (in mA).

V_{R1}/R_1	V_{R2}/R_2	V_{R3}/R_3

What is $V_{R2}/R_2 + V_{R3}/R_3$? Compare with V_{R1}/R_1.

3. REMOVE/DISCONNECT the power supply from the circuit. Measure the resistance between points A and B, then between B and C, and finally between A and C. Tabulate below (in ohms).

R_{AB}	R_{BC}	R_{AC}

a. Compare the value of R_1 in part 1 to the measured R_{AB}.
b. Compare the value of parallel combination of R_2 and R_3 in part 1 to the measured R_{BC}.
c. Compare the equivalent resistance of the combination of R_1, R_2 and R_3 in part 1 to the measured R_{AC}.

4. Reconnect the power supply to the circuit. Measure the voltages between points A and C, then between A and B, and finally between B and C. Tabulate below (in volts).

V_{AC}	V_{AB}	V_{BC}

a. Compute V_{AB} using voltage division and the measured resistance values from part 3. Compare the computed value to the measured V_{AB}.
b. Compute V_{BC} using voltage division and the measured resistance values from part 3. Compare the computed value to the measured V_{BC}.